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What do Mars and Hawaii Have in Common?

Peeking through the scattered clouds over the North Pacific Ocean on September 19, 2014 are the eight major islands that comprise the archipelago of the Hawaiian Islands.

The Pacific Plate is shifting northward above a volcanic hotspot in the Earth's mantle at the whiplash-inducing rate of 32 miles every million years. This hotspot currently lies beneath the southernmost of the Hawaiian Islands, known as Hawai'i, or the Big Island. Erosion has taken its toll on the older islands to the north, which are all significantly smaller than the Big Island.

If the magma produced by a volcano is highly fluid it will spread out as it cools to form a shape not unlike a warrior's shield. Mauna Loa is the largest such shield volcano on Earth, and fills up more than half of the Big Island of Hawai'i.

The largest volcano in the solar system is also of the shield variety. Unlike Mauna Loa however, Olympus Mons formed long after any tectonic activity on Mars had ceased. Rather than producing a series of smaller shields, the hotspot beneath Olympus Mons created one ridiculously large shield. It's about as a wide as the entire Hawaiian chain, and at 15.5 miles high it dwarfs Mauna Loa, which peaks out at 5.7 miles above the ocean floor.